

Claims

1. (Currently amended) A composite, comprising:
a substrate;
a pillar formed on the substrate at a selected location comprising an insulating, semiconducting or conducting material, the pillar further comprising a catalyst; and
a nanoscale structure formed on the pillar.
2. (Original) The composite according to claim 1 where the nanoscale structure comprises a nanotube.
3. (Original) The composite according to claim 1 where the pillar comprises a semiconducting material.
4. (Original) The composite according to claim 1 where the pillar comprises a metal selected from the group consisting of W, Pt, Au, Al, Fe, Ni, Ti, Ta, Cu, and combinations thereof.
5. (Original) The composite according to claim 1 where the pillar is electrically connected to an electronic device.
6. (Currently amended) The composite according to claim ~~2~~ 1 further comprising a catalyst deposited on the pillar for nanotube synthesis of the nanoscale structure.
7. (Original) The composite according to claim 1 where the substrate is silicon, and the pillar is platinum.
8. (Original) The composite according to claim 2 where the nanotube is a carbon nanotube.
9. (Original) The composite according to claim 1 where the composite forms a field emitter device where the pillar comprises a tungsten tip and a nanotube is formed on the tip.

10. (Original) The composite according to claim 9 where the device has a single field emitter.

11. (Original) The composite according to claim 1 where the composite forms a device having at least two terminals.

12. (Original) The composite according to claim 11 where the composite forms a transistor.

13. (Original) The composite according to claim 12 where the nanoscale structure is a nanotube having a diameter of from about 1 to about 10 nm.

14. (Original) The composite according to claim 10 where the nanoscale structure is a nanotube having a diameter of from about 10 to about 1000 nm.

15. (Original) The composite according to claim 8 where the nanotube has a diameter of from about 1 to about 200 nm.

16. (Original) The composite according to claim 8 where the nanotube has a diameter of from about 1 to about 100 nm.

17. (Original) The composite according to claim 1 where the substrate includes at least one of a metal, ceramic, plastic or a semiconductor.

18. (Original) The composite according to claim 1 where the substrate includes at least one of silicon, silicon nitride, quartz and mica.

19. (Original) The composite according to claim 1 where the nanoscale structure comprises at least one of carbon, zinc oxide, cadmium sulfide and silicon dioxide.

20. (Original) The composite according to claim 19 where the nanoscale structure is a ZnO nanowire.

21. (Original) The composite according to claim 20 where the ZnO nanowire functions as a field emitter.

22. (Original) The composite according to claim 1, further comprising plural pillars arranged on the substrate in a selected pattern; and plural nanoscale structures formed on the pillars.

23. (Original) The composite according to claim 22 where each pillar is associated with one pixel in a flat panel display.

24. (Original) The composite according to claim 23 where a single carbon nanotube is formed on each pillar.

25. (Original) The composite according to claim 23 where a single ZnO nanowire is formed on each pillar.

26. (Original) The composite according to claim 22 where at least one pillar forms an electrical connection to a circuit formed on the substrate.

27. (Original) The composite according to claim 22 where the pillars have a width of from about 10 nm to about 1 μ m.

28. (Original) The composite according to claim 22 where the plural nanoscale structures form a field emitter device.

29. (Currently Amended) The composite according to claim 24 where the nanotubes have a diameter of from about 1 to about ~~1- μ~~ 200 nm.

30-48. (Withdrawn)

49. (New) The composite of claim 1 wherein the pillar comprises a first material and the substrate comprises a second material.

50. (New) A composite, comprising:
a substrate;
a pillar formed on the substrate at a selected location comprising an insulating, semiconducting or conducting material; and
a nanoscale structure other than a carbon nanotube formed on the pillar.

51. (New) The composite of claim 50 wherein the nanoscale structure is a nanowire, nanocoil, nanobelt, or combination thereof.

52. (New) The composite of claim 51 wherein the nanoscale structure comprises zinc oxide, silicon dioxide, tungsten oxide, cadmium sulfide, carbon, silicon carbide, or combinations thereof.

53. (New) The composite of claim 1 wherein the substrate comprises plastic, silicon nitride, quartz, or mica, or combinations thereof, the pillar comprises Pt, Au, Fe, Ni, Ti, or combinations thereof, and the nanoscale structure comprises zinc oxide, cadmium sulfide, silicon dioxide, or combinations thereof.

54. (New) A composite, comprising:
a substrate;
a pillar formed on the substrate at a selected location comprising an insulating, semiconducting or conducting material, the pillar further comprising a catalyst; and
a single nanoscale structure formed on the pillar.